

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
29 January 2004 (29.01.2004)

PCT

(10) International Publication Number
WO 2004/009244 A3

(51) International Patent Classification⁷: B04C 5/103, 5/13

(74) Agent: STEWART, Charles, W.; Shell Oil Company,
One Shell Plaza, P.O. Box 2463, Houston, TX 77252-2463
(US).

(21) International Application Number:

PCT/US2003/022294

(22) International Filing Date: 17 July 2003 (17.07.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
02077964.1

19 July 2002 (19.07.2002) EP

(71) Applicant (for all designated States except US): SHELL
OIL COMPANY [US/US]; Department of Intellectual
Property, One Shell Plaza, P.O. Box 2463, Houston, TX
77252-2463 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,
SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(72) Inventors; and

(75) Inventors/Applicants (for US only): DEWITZ, Thomas,
Shawn [US/US]; 4613 Valerie Street, Bellaire, TX 77401
(US). DRIES, Hubertus, Wilhelmus, Albertus [NL/NL];
Badhuisweg 3, NL-1031 CM Amsterdam (NL). EKKER,
Andreas [NL/NL]; Badhuisweg 3, NL-1031 CM Am-
sterdam (NL). KATER, Jan [NL/NL]; Badhuisweg 3,
NL-1031 CM Amsterdam (NL). SANBORN, Richard,
Addison [US/US]; 12418 Mossycup Drive, Houston, TX
77024 (US).

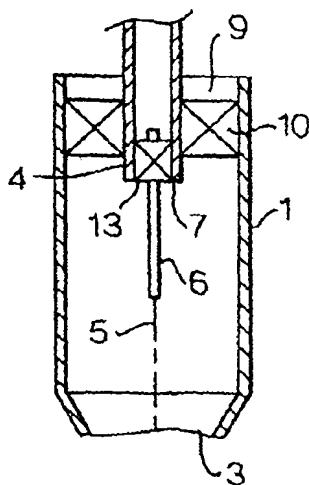
Published:

— with international search report

(88) Date of publication of the international search report:
10 June 2004

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: CYCLONE SEPARATOR WITH A VORTEX EXTENDER PIN



(57) Abstract: Swirl tube separator for separating solids from a gas-solid containing feed comprising a tubular housing, an inlet for introducing a gas-solids mixture at one end of said housing, a solids outlet opening at the opposite end of said housing, and a co-axial positioned tubular gas outlet conduit placed at an end of said housing, wherein along the axis of the tubular housing a vortex extender pin is present.

WO 2004/009244 A3